EUROPEAN JOURNAL FOR SPORT AND SOCIETY
2019, VOL. 16, NO. 1, 44–63
https://doi.org/10.1080/16138171.2019.1603832

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ORIGINAL ARTICLE

The transition to adulthood: a game changer!? A longitudinal analysis of the impact of five major life events on sport participation

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ABSTRACT

This article investigates the relationship between major life events and sport participation during the transition to adulthood. Two waves (2009 and 2013) of a Dutch panel study provided information on education, employment, relationship, civil/marital status, and parenthood for 2829 Dutch citizens (ages 15–45) and their sport behaviour. Our analyses indicate that respondents who left full-time education, began to work, entered and/or formalised a relationship, and became a parent participated less frequently in sport than those who did not (between-person differences). Moreover, experiencing these events reduced sport frequency (within-person changes). All events except beginning to work reduced the number of sports practised. Further, those who entered an intimate relationship were more likely to switch from a 'heavy' club-sport setting to a 'lighter', more individualised setting and to stop practising sport altogether, compared to those who stayed single. Those who left full-time education and started working were more likely to continue sport in a club setting, compared to those who continued education and did not start working. Sport providers, programmes, and policies could use these results to inform efforts to pre-empt impacts of major life events, thus curbing drop out and retaining sport participants, especially during the transition to adulthood.

KEYWORDS

Life events; sport participation; sport club membership; adulthood; transitions

1. Introduction

The social significance of sport has surged in recent decades. Appreciation of sport's functional power stems from its advantageous consequences (Schlesinger & Nagel, 2015; Waardenburg & Van Bottenburg, 2013) in improving health (Miles, 2007), nurturing social capital and integration and thereby fostering social networks (Knoppers,

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Supplemental data for this article can be accessed here.

2006; Putnam, 1995; Seippel, 2006), and spurring economic growth (European Commission, 2013; Van der Meulen et al., 2012). Sports clubs form the heart of the Western European sport industry. Sport participation in club-organised settings is often regarded as particularly beneficial (Borgers, Seghers, & Scheerder, 2016; Breuer, Hoekman, Nagel, & Van der Werff, 2015; Janssens & Verweel, 2014), especially for young people (Theeboom, Haudenhuyse, & De Knop, 2010; Vandermeerschen, Vos, & Scheerder, 2016). Accordingly, sports clubs have become increasingly important on the political agenda (Schlesinger & Nagel, 2015). 'Sport for All' policies and programmes have been implemented at the local, national, and international level to lower the threshold for sport participation and boost involvement in sport, particularly club-organised sport, among people of all ages (DaCosta & Miragaya, 2002; European Commission, 2011; NOC*NSF, 2012; Tuyckom, 2011; Waardenburg & Van Bottenburg, 2013).

Nonetheless, research shows that continuation (also called 'tracking') of sport participation from adolescence into adulthood remains a stumbling block (Hirvensalo & Lintunen, 2011; Malina, 2001; Telama, 2009; Vanreusel et al., 1997). Especially in late adolescence, individual sport participation levels decline (Engel & Nagel, 2011; Leslie, Fotheringham, Owen, & Bauman, 2001; Tuyckom, 2011). Many adolescents drop out of club-organised sport (Borgers, Seghers, et al., 2016; European Commission, 2014; Lunn, 2010; Pilgaard, 2013; Scheerder et al., 2006).

The current study sought to better understand changes in sport participation during the transition to adulthood, pursuing several advancements. First, to bring out the dynamic character of sport participation we investigated not only within-person changes, but also differences between individuals in sport frequency, the number of sports practised, and the settings of sport activity during the transition to adulthood (Engel & Nagel, 2011). Previous retrospective and longitudinal studies found that sport participation over the life course is characterised more by changes in activity level and sort of activities than by dropping out of sport with increasing age (Butcher, Lindner, & Johns, 2002; Engel & Nagel, 2011; Lunn, 2010; Pilgaard, 2013; Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002; Scheerder et al., 2006). Activity levels and club sport participation are generally highest among youngsters (European Commission, 2014). Upon reaching adulthood many people quit club-organised sport (Borgers, Seghers, et al., 2016; European Commission, 2014; Lunn, 2010; Pilgaard, 2013; Scheerder et al., 2006; Vandermeerschen et al., 2016). Findings on the relationship between age and sport activity, however, are contradictory (Borgers, Breedveld, et al., 2016). The issue is whether dropping out of a (club-organised) sport during the transition to adulthood means quitting sport altogether, or if it merely reflects a way of continuing sport under other conditions, like a different informal or organisational setting (Borgers, Seghers, et al., 2016). In our study we analysed changes in individuals' sport frequency and number of sports practised, alongside the likelihood of switching from a club sport to some other informal or organisational setting, or dropping out of sport altogether. This last aspect is particularly relevant, as sport contexts and practices have become increasingly diversified and de-traditionalised (Borgers et al., 2016; Klostermann & Nagel, 2014).

Second, the current study expands on earlier research on sport participation by focusing on multiple individual life events that mark the transition to adulthood. We examined five major life events: leaving full-time education, beginning to work, entering an intimate relationship, starting to cohabit or getting married, and the birth of the first child (Arnett, 2007; Kilmartin, 2000; Raymore, Barber, & Eccles, 2001; Zarrett & Eccles, 2006). These life events alter roles and responsibilities, leading to changes in daily routines and opportunities (Hirvensalo & Lintunen, 2011; Holmes & Rahe, 1967). Experiencing such a life event also changes needs, resources, and restrictions with regard to sport participation (Engel & Nagel, 2011; Hirvensalo & Lintunen, 2011; Lunn, 2010; Pilgaard, 2013; Van Houten, Hermsen, Kraaykamp, & Elling, 2014; Van Houten, Kraaykamp, & Breedveld, 2017). Few previous studies have examined the influence of such major life events on sport participation (Allender, Hutchinson, & Foster, 2008; Engberg et al., 2012; Hirvensalo & Lintunen, 2011). In our study, we developed a theoretical framework to explain the consequences of major life events for sport participation, based on changes in temporal and social resources associated with major life events (Kraaykamp, Van Gils, & Van der Lippe, 2009; Schor, 1991; Van Houten et al., 2014, 2017).

Third, we analytically propose a prospective life-course design (Engel & Nagel, 2011; Heikkinen, 2011; Hirvensalo & Lintunen, 2011) to test whether major life events affect an individual's sport participation. Previous research has employed mainly cross-sectional data (Pilgaard, 2013). This makes it impossible to investigate individual changes over time or to draw conclusions in terms of causes and consequences (Kraaykamp, Oldenkamp, & Breedveld, 2013; Pilgaard, 2013; Van Houten et al., 2017). We used panel data (2009 and 2013) from the Netherlands Longitudinal Lifecourse Study (Tolsma, Kraaykamp, Graaf, Kalmijn, & Monden, 2014) to identify differences between and changes within the life course of respondents (Pilgaard, 2013).

Our main research question reads as follows: To what extent do major life events that mark the transition to adulthood affect (1) the number of different sports practised by individuals, (2) their frequency of sport participation, and (3) their likelihood of switching from practising sport (mostly) in a club setting to practising sport in other informal or organisational settings, or not practising sport at all?

2. Theoretical framework

2.1. A changing context of sport participation

Different sport participation profiles and configurations of sport systems can be found throughout Europe (Breuer, Hoekman, Nagel, & Van der Werff, 2015; Camy, Clijsen, Madella, & Pilkington, 2004; Van Tuyckom, 2013). In most countries (especially in the Western and Eastern parts of Europe), nonetheless, sport participation has become diversified and de-traditionalised in recent decades, due to societal processes of individualisation, modernisation and informalisation (see, e.g. Borgers et al., 2018; Klostermann & Nagel, 2014; Van Ingen & Dekker, 2011). This has produced the emergence of commercial health and fitness centres, mass market sporting events, sport programmes hosted by municipalities or private companies, and sporting activities organised by people on their own or in informal groups (Borgers, Seghers, et al., 2016;

Borgers et al., 2018; Breuer, Hoekman, Nagel, & Van der Werff, 2015; Klostermann & Nagel, 2014). A conceptual model by Borgers et al. (2016) classifies these various sport settings based on how 'heavy', or demanding, participation is, according to their formal organisational structures and the facilities offered (supply side) and rules, expectations, and responsibilities set by or imposed on others (demand side). Sports clubs run voluntarily by and for members constitute a formal setting for sport participation that is 'heavy' on both counts (Borgers, Breedveld, et al., 2016; Borgers, Seghers, et al., 2016; Coakley, 2004; Ibsen & Seippel, 2010; Pilgaard, 2013). At the other end of the spectrum are settings that offer the 'lightest' alternatives, like practising sport alone or in an informal group (Borgers et al., 2018; Scheerder & Van Bottenburg, 2010).

In most European countries, including the Netherlands, practising sport in a 'heavy' club setting is most common among young people and men. Although the Netherlands have the highest sports club membership rates of Europe and gender differences are small (Breuer, Hoekman, Nagel, & Van der Werff, 2015; European Commission, 2014). According to the most recent data on sports club membership of the Dutch population (ages 6 and older), 31% (34% of the men and 28% of the women) participate in a club setting (The Netherlands Institute for Social Research & Statistics Netherlands, 2016). Borgers, Breedveld, et al. (2016) refer to an emerging body of literature indicating a rise of 'light' sport settings over the past 20–30 years. These 'light' settings are particularly gaining popularity during the transition to adulthood, which appears to come along with a drop-out from club-organised sport and a drop-in to sport light (Borgers, Seghers, et al., 2016; European Commission, 2014; Lunn, 2010; Pilgaard, 2013; Scheerder et al., 2006; Vandermeerschen et al., 2016). This presents a challenge to sports clubs, as lighter settings seem to fulfil a need for less frequent and less time consuming modes of sport participation (Borgers, Breedveld, et al., 2016) and more flexible patterns of sport participation when entering a new life phase in life, like adulthood (Borgers, Seghers, et al., 2016; Lunn, 2010; Pilgaard, 2013; Scheerder & Vos, 2011). Earlier research indicates that this is especially true for women, showing they spend less time on sport and practice sport less frequently than men (for a review of existing literature on the frequency of and time spend on sport participation, see: Borgers, Breedveld, et al., 2016). Additionally, in the Netherlands, women are less likely than men to prefer a club setting to a light setting when starting a new sport (Van Houten et al., 2014), and specifically young Dutch women (aged 18–35) are more likely to stop practising a sport in general and in a club setting in particular, compared to their male counterparts (Van Houten et al., 2017). In the next section, we develop a theoretical framework to explain the effects of major life events that mark the transition to adulthood on the likelihood of switching from practising sport in a club setting to practising sport in a 'light' setting or not practising sport at all, as well as differences and changes in the number of sports practised and sport frequency.

2.2. The effects of major life events: a resource approach

The road to adulthood is marked by milestones such as leaving full-time education, beginning work, engaging in an intimate relationship, starting to cohabit, getting married, and birth of the first child (Arnett, 2007; Hirvensalo & Lintunen, 2011; Kilmartin,

2000). These so-called 'transition events' represent changes from adolescence to a more adult status within different life domains (Bell & Lee, 2005). These transitions bring new roles and responsibilities, alongside a new organisation of everyday life (Borgers, 2015). How these major life events affect young adults' sport behaviour may be understood by looking at changes in the resource balance associated with each, especially in terms of spare time and social contacts (Hirvensalo & Lintunen, 2011; Holmes & Rahe, 1967; Van Houten et al., 2014, 2017). In the neo-Weberian tradition of looking at social action from a resource perspective (Bourdieu, 1978; Coleman, 1990; Sugden et al., 2000; Weber, 1978), life chances – i.e. opportunities to access scarce and valued outcomes, like (club) sport participation – are distributed according to the resources an individual possesses (Breen, 2005). Thus, changes in a person's sport behaviour during their transition to adulthood may be interpreted as an alternation of their disposition in the field of sport for adapting to a new configuration of spare time and social surroundings (Borgers, Seghers, et al., 2016; Engel & Nagel, 2011; Pilgaard, 2013; Van Houten et al., 2014, 2017). In line with this approach, we reason that changes and differences in the number of sports, the frequency of sport participation, and the switch from a club setting to a 'lighter' sport setting (or dropping out of sport altogether) can be explained by changes and differences in temporal and social resources related to the occurrence of major life events.

First, temporal resources are a prerequisite for sport participation (Van Houten et al., 2014, 2017). Sufficient spare time has to be available (Schor, 1991), in time slots suited to a specific activity (Gershuny, 2000). General considerations of time budget theory and temporal organisation theory (Southerton, 2006) suggest that time constraints make it hard to create free time slots, thus reducing opportunities for leisure activities (Kraaykamp et al., 2009). This is clearly an issue in sport participation, as lack of time is by far the most mentioned reason for not practising sport (European Commission, 2014). The main constraints reported for sport participation relate to work or study, social commitments, and family obligations (Deelen, Ettema, & Dijst, 2016). Not only is time scarce, but time devoted to one activity often must be traded off against time required for other pursuits. Because leisure activities like sport are relatively informal and optional, people feel pressure to relinquish these when more formal, obligatory tasks arise, like paid work or childcare (Kraaykamp et al., 2009).

Second, practising sport is influenced by individuals' social surroundings; social network contacts may encourage but also discourage sport participation (Kraaykamp et al., 2013). At the same time, sport participation provides social resources, facilitating growth and maintenance of social networks and social capital (Putnam, 1995). Social motivation theory helps us to understand why changes in social resources associated with the transition to adulthood may influence people to change the time they devote to sport participation (Van Houten et al., 2017). This theory states that people gravitate towards activities that have a high social payoff, especially when they are experiencing time constraints (Hills, Argyle, & Reeves, 2000). A major life event is likely to change the relevance of the social resources that come with practising a sport. Specifically, starting a job, entering an intimate relationship, and having a child may lead to alternative social resources, with higher social payoffs in the new social network. This

increases the likelihood that existing sport practices will be traded off for new activities, possibly leading to changes in sport behaviour, like participating less frequently, in fewer sports, and in a 'lighter' setting (or not at all) (Van Houten et al., 2017).

2.3. The effects of major life events: expectations

Major life events that accompany the transition to adulthood – like leaving full-time education and beginning work, entering an intimate relationship, formalising a relationship through cohabitation or marriage, and becoming a parent – impose restrictions on time to practise sport (Deelen et al., 2016; Kraaykamp et al., 2009; Ruseski, Humphreys, Hallmann, & Breuer, 2011; Tiessen-Raaphorst, Van den Dool, & Vogels, 2014; Van Houten et al., 2014, 2017). These major events, additionally, bring new roles and social responsibilities, like maintaining a professional and family network, providing for a partner, and taking care of a child, which are likely to be of greater importance than sport-related roles and responsibilities. The social payoffs of existing sport activities will therefore diminish, and likely be traded off against career and family social needs (Van Houten et al., 2014, 2017).

The reduction of temporal resources and increase of professional and social obligations that accompany the transition to adulthood induce people to re-evaluate and seek alternative ways to continue sport participation. One option could be to spend less time (slots) on sport, lowering the frequency of sport participation. Reducing sport frequency, however, might not be easily achieved, especially if sport involves social obligations to other sport participants (e.g. team members, opponents, and training partners) and regular participation is required, as in 'heavy' club settings (Borgers, Breedveld, et al., 2016). Another opportunity, to reduce time investments in sport, would be to drop one or more sports. Consequently, we expect major life events to reduce the sport frequency and number of sports practised in young adulthood.

Individuals who practise sports in 'heavy' club settings have the possibility to switch to sport in a 'lighter' setting. These provide more individualised ways of practising sport and are less constrained by fixed schedules, fixed locations, and social expectations. Participants thus have more flexibility and autonomy and hence more opportunities to practise sport where, when, how often, and with whom suits their personal situation (Borgers, et al., 2018; Borgers, Seghers, et al., 2016; Pilgaard, 2013). Switching to a light sport setting during the transition to adulthood might enable them to dedicate inferior time slots to sport (e.g. late or early hours, small time slots, or irregular slots), while maintaining the social payoffs of sport activities. Finally, sport in light settings can be practised more easily with significant others, such as with one's partner, child(ren), family members, and colleagues.

3. Methods

3.1. Data and methods

To answer our research question we employed data from the 2009 and 2013 waves of the *Netherlands Longitudinal Lifecourse Study* (Tolsma et al., 2014). This is a nationally representative large-scale panel survey of 15–45-year-olds in the Netherlands. A two-

stage stratified sampling technique was applied. In the first stage, a quasi-random selection was made of 35 municipalities by region and urbanisation. In the second stage, a random selection was performed from the selected municipalities' population registries. The fieldwork of the first wave was done by Intomart GfK. The questionnaire of the first wave consisted of two parts: a face-to-face fully structured interview and a self-completion questionnaire. The fieldwork of the second wave was done by Veldkamp in a mixed mode: all questions were either administered face-to-face or via a computer-assisted web interview (CAWI). To facilitate the study of social dynamics from a life-course perspective, data was collected on a range of topics, including respondents' life transitions and leisure activities. This makes NELLS especially suited for our investigation of changes in sport participation and the influences of life events that mark the transition to adulthood. For a full description of sampling, the design and fieldwork and coding, see Tolsma et al. (2014).

For our study, we employed information on 2829 respondents who participated in both waves (response rate wave 1: 52%; wave 2: 75%). We further selected respondents without missing information on the relevant measures. We excluded 463 respondents who had experienced reversed transitions following the transition to adulthood, such as ending a relationship and quitting a job. By doing so we avoided ambiguities in interpretation of effects of the major life events as markers of the transition to adulthood, in line with our theoretical framework. For our examination of dropping out of club-organised sport, we further restricted the sample to individuals who practised sport (mostly) in a club setting in wave 1 (2009). This produced a sample of 2317 individuals for our analyses of the number of sports and frequency of participation, and a more restricted sample of 522 individuals for our analysis of the switch from a club setting to a lighter setting or not practising sport at all.

3.2. Measurements

The NELLS questionnaires asked respondents to indicate for 10 sports (fitness, jogging, soccer, tennis, field hockey, swimming, martial arts, volleyball, cycling, and other) whether they participated '4 times or more per month', '1 to 3 times per month', 'less than once a month', or 'not at all', in the past 12 months. The *number of sports* was measured as the sum of all sports the respondent participated in. To measure *sport frequency*, we recoded sporting 'not at all' as 0, 'less than once a month' as 0.5, '1 to 3 times per month' as 2, and '4 times or more per month' as 4. We then constructed a scale, from 0 to 40, adding the scores for all 10 sport activities. Respondents were also asked in what type of organisation they usually practised the sport they participated in most often. Answer categories were 'sports club', 'commercial sport provider (e.g. health centre, gym, climbing hall)', 'alternative sport provider (e.g. a community, company, or student sport programme)', 'not at an organisation (e.g. with friends, colleagues, or family members)', and 'not at an organisation (I practise this sport alone)'. Based on this information, we used the following categories for *sport setting*: (0) club setting, (1) commercial or alternative setting, (2) informal group setting, (3) individual setting, and (4) not practising sport at all.

To identify the major life events that often mark the transition to adulthood, namely, *leaving full-time education*, *beginning work*, *entering an intimate relationship*, *starting to cohabit or getting married*, and *becoming a parent*, we used information on education, employment, relationship, civil/marital status, and parenthood in wave 1 and wave 2. Based on these statuses we could determine whether respondents had experienced such a major life event (1) or not (0), and whether the respondent experienced the transition to adulthood within these different life domains before wave 1, between wave 1 and wave 2, or not at all.

In the Netherlands (and in many other European countries as well), lower sport participation rates can be found for women (as described in more detail in the theoretical framework), older age groups, immigrants and lower educated people, compared to their counterparts (The Netherlands Institute for Social Research & Statistics Netherlands, 2016; Tiessen-Raaphorst, 2015; Tiessen-Raaphorst et al., 2014). Therefore, we constructed control variables for these personal characteristics. We included (1) *female* (male = 0) and (1) *immigrant* (at least one parent born outside the Netherlands) (Dutch native = 0). *Age* was measured as a continuous variable, ranging from 14 to 49 years in wave 1. *Educational level* refers to the highest schooling level completed or currently in progress in years, defined as the nominal duration in years of schooling for each type of education, varying from 4 years for not completed primary school, to 16.5 years for a university degree. When respondents reported a diminishment of their educational status between the waves (most likely because they dropped out), we used the educational level reported in wave 1. Respondents were removed from our analyses if they reported a decrease of more than 2.5 years, because this was likely indicative of measurement error. Table 1 presents the variables.

3.3. Analytical strategy

We performed different types of analyses to gain insight into the role of major life events in respondents' sport participation. First, information on the frequency and number of sports were obviously counted data. Both aspects were characterised by a highly right-skewed frequency distribution. We performed statistical tests to assess the degree of overdispersion; this appeared to be insignificant ($p = .85$) for the number of sports, but highly significant ($p = .00$) for the more skewed sport frequency. Therefore, we used the Poisson distribution to model the number of sports and a negative binomial distribution for sport frequency.

Second, to assess changes in these variables between waves, we applied multilevel modelling for longitudinal data (Singer & Willett, 2003; Snijders & Berkhof, 2007). In such models, wave 1 and wave 2 observations constitute the lower-level units that are nested within persons. Snijders & Berkhof (2007) showed that estimates of a regression coefficient for a lower-level predictor, for instance 'being a parent' may reflect not only a within-person effect (becoming a parent), but also a between-person effect (difference between parents and non-parents). Such confounding is undesired, as we are interested in both the influence of change experienced by individuals and interpersonal differences. Using a 'between-within' model (Neuhaus & Kalbfleisch, 1998), or 'hybrid' method as Allison (2009) calls it, a corrected estimate of the within-person

Table 1. Description of all variables.

	Descriptive statistics based on the total sample used for the analyses of number of sports and sport frequency															Descriptive statistics based on the more restricted sample used for the analysis of switching from a club setting to a lighter setting or to not practising sport at all											
	Wave 1					Wave 2					Change between w1 and w2					Wave 1					Wave 2					Change between w1 and w2				
	N	Min.	Max.	Mean/ Perc.	SD	N	Min.	Max.	Mean/ Perc.	SD	N	Min.	Max.	Mean/ Perc.	SD	N	Min.	Max.	Mean/ Perc.	SD	N	Min.	Max.	Mean/ Perc.	SD	N	Min.	Max.	Mean/ Perc.	SD
Number of sports	2317	0.0	10.0	2.2	1.8	2317	0.0	10.0	2.1	1.7	2317	−10.0	10.0	−0.1	1.8	522	1.0	10.0	3.2	1.8	522	0.0	10.0	2.8	1.7	522	−7.0	7.0	−0.3	2.0
Practised in the past 12 months																														
Sport frequency	2317	0.0	40.0	4.6	4.3	2317	0.0	40.0	4.6	4.3	2317	−40.0	40.0	0.1	4.7	522	0.5	30.0	7.0	4.0	522	0.0	40.0	6.3	4.4	522	−15.0	27.5	−0.7	4.6
Per month																														
Sport setting																														
Club setting	536			23.1%		470			20.3%		−66			−2.8%		522			100.0%		275			52.7%		−247			−47.3%	
Commercial/alternative setting	581			25.1%		563			24.3%		−18			−0.8%		0			0.0%		82			15.7%		82			15.7%	
Informal group setting	418			18.0%		384			16.6%		−34			−1.5%		0			0.0%		64			12.3%		64			12.3%	
Individual setting (alone)	360			15.5%		516			22.3%		156			6.7%		0			0.0%		73			14.0%		73			14.0%	
Not practising sport at all	422			18.2%		384			16.6%		−38			−1.6%		0			0.0%		28			5.4%		28			5.4%	
Major life events																														
Educational domain																														
In full-time education	543			23.4%		286			12.3%							192			36.8%		112			21.5%						
not in full-time education	1774			76.6%		2031			87.7%		257			11.1%		330			63.2%		410			78.5%		80			15.3%	
Employment domain																														
Not working >32 hours a week	1520			65.6%		1303			56.2%							332			63.6%		281			53.8%						
Working >32 hours a week	797			34.4%		1014			43.8%		217			9.4%		190			36.4%		241			46.2%		51			9.8%	
Relationship domain																														
Single	696			30.0%		480			20.7%							204			39.1%		135			25.9%						
In a relationship	1621			70.0%		1837			79.3%		216			9.3%		318			60.9%		387			74.1%		69			13.2%	
Civil/marital domain																														
Not cohabiting/not married	885			38.2%		681			29.4%							260			49.8%		199			38.1%						
Cohabiting/married	1432			61.8%		1636			70.6%		204			8.8%		262			50.2%		323			61.9%		61			11.7%	
Parental domain																														
Non-parent	1056			45.6%		900			38.8%							305			58.4%		267			51.1%						
Parent	1261			54.4%		1417			61.2%		156			6.7%		217			41.6%		255			48.9%		38			7.3%	
Controls																														
Female	2317			54.3%		2317			54.3%							522			43.3%		522			43.3%						
Immigrant	2317			38.8%		2317			38.8%							522			29.5%		522			29.5%						
Age	2317	14.0	49.0	31.7	9.3	2317	19.4	53.0	36.0	9.2	2317	2.1	6.9	4.2	1.0	522	14.0	49.0	29.0	10.2	522	19.4	53.0	33.1	10.1	522	2.1	6.6	4.1	1.0
Educational level (highest)	2317	4.0	16.5	11.0	3.2	2317	4.0	16.5	11.7	3.1	2317	0.0	12.5	0.8	1.6	522	6.0	16.5	11.3	3.0	522	6.0	16.5	12.2	2.9	522	0.0	8.5	0.9	1.7

effect of a predictor can be obtained by centring the predictor around its cluster mean. In our study, this was the mean of both observations for each respondent. Including these centred predictors instead of the original ones as 'within variables', as well as the personal means as 'between variables' in the multilevel models, yielded estimates of the within-person changes and the between-person differences in the number of sports and the frequency of sport participation after each of the major life events in the models. In Poisson and negative binomial models, the Exp(*B*) parameter of a predictor was interpreted as a percentage change in the number of sports, or sport frequency, given a 1-unit increase of the predictor in question.

Third, to study the extent that major life events affected dropping out from club-organised sport during the transition to adulthood, we conducted multinomial logistic regression analyses. We related the occurrence of major life events to whether or not respondents switched from practising sport (mostly) in a club setting to practising sport in a light setting (commercial/alternative, group or individual), or not practising sport at all. The Exp(*B*) parameters in these analyses can be interpreted as a percentage change of the odds of switching versus staying in a club setting given a 1-unit increase of the independent variable. Regarding the five major life events, an Exp(*B*) greater than 1 indicates that the odds of switching to a light setting or stopping are higher for those who experienced the event between both waves or prior to the first wave, compared to respondents who did not experience that event (reference category).

During the four-year period under investigation, the major life events often happened in multiples. For example, of all respondents who entered an intimate relationship, 76% also experienced one or more of the other events. The most solitary event was becoming a parent, though 39% of the respondents who became a parent also experienced at least one other event. As a result of their connectedness, the independent influences of the life events on sporting behaviour were not easily established; including all events in a single regression model produced unstable estimates for the data at hand. Hence, we examined the influence of each event in a separate analysis, in which we controlled for gender, ethnicity, and age (plus educational level and number of sports when analysing dropping out of club-organised sport), but not for the influence of the other events. This resulted in multiple estimates for the controls and other statistics (e.g. the intercept, the log-likelihood, and the Wald chi-square), which are therefore not presented. The complete results from these separate analyses, as well as from additional analyses including all events and controls simultaneously, are available from the authors upon request.

4. Results

4.1. Number of sports

Table 2 presents the effects of the major life events on the number of different sports practised by young adults, based on Poisson regression analyses and controlled for gender, ethnicity, age (between-person difference), and ageing (within-person change). For four out of the five major life events, we observed significant between-person differences in the number of sports, in line with our expectations. Our results indicate

Table 2. The effects of major life events on the number of sports and sport frequency.

	Number of sports[a]		Sport frequency[b]	
	Exp(B)	sig.[c]	Exp(B)	sig.[c]
Major life events[d]				
Educational domain				
Not in full-time education vs. in full-time education[e]	0.599	0.000***	0.550	0.000***
Leaving full-time education[f]	0.891	0.049*	0.819	0.003**
Employment domain				
Working vs. not working (>32 hours a week)[e]	0.950	0.166	0.913	0.064+
Beginning work (>32 hours a week)[f]	0.932	0.290	0.838	0.015*
Relationship domain				
In a relationship vs. single[e]	0.933	0.072+	0.861	0.004**
Entering an intimate relationship[f]	0.882	0.048*	0.848	0.023*
Civil/Marital domain				
Cohabiting/married vs. not cohabiting/not married[e]	0.870	0.000***	0.817	0.000***
Starting to cohabit/getting married[f]	0.895	0.101	0.825	0.011*
Parental domain				
Parent vs. non-parent[e]	0.842	0.000***	0.764	0.000***
Becoming a parent[f]	0.808	0.007**	0.770	0.003**

Source: NELLS wave 1 (2009) and wave 2 (2013); $N = 2.317$.
[a]Mixed-effects Poisson regression analyses.
[b]Mixed-effects negative binomial regression analyses.
[c]$+p < .10$; $*p < .05$; $**p < .01$; $***p < .001$ (two-tailed).
[d]We examined the influence of each event in a separate analysis, in which we controlled for gender, ethnicity, age (between-person differences), and ageing (within-person changes).
[e]Between variable: Exp(B) = estimate of the between-person effect of the event, thus reflecting interpersonal differences.
[f]Within variable: Exp(B) = estimate of the within-person effect of the event, thus reflecting changes within individuals.

that respondents who left full-time education practised 40.1% fewer sports than those still in full-time education in wave 2 (Exp(B) = 0.599). Having a relationship had a negative effect as well. Respondents who were in a relationship in both waves practised 6.7% fewer sports than singles (Exp(B) = 0.933), and those who were cohabiting or married practised 13% fewer sports than those who were not cohabiting or married (Exp(B) = 0.870). Additionally, parents practised 15.8% fewer sports than non-parents (Exp(B) = 0.842). We did not find significant between-person differences for employment.

Within-person changes in the number of sports practised after a major life event all point in the expected direction, with Exp(B) consistently less than 1. This indicates that the number of sports decreased when individuals left full-time education, began to work, entered an intimate relationship, cohabited or married, and became a parent. Occurrence of three of these events between the two waves resulted in significant changes: the number of sports practised by respondents fell by 10.9% when leaving full-time education (Exp(B) = 0.891), by 11.8% when entering an intimate relationship (Exp(B) = 0.882), and by 19.2% when becoming a parent (Exp(B) = 0.808).

4.2. Frequency of sport participation

Table 2 also displays results on the effects of the major life events on the sport frequency of our respondents, based on negative binomial regression analyses, again controlled for gender, ethnicity, age (between-person difference), and ageing (within-person change). We found significant between-person differences in sport frequency with respect to all major life events. As expected, those who had experienced a major

life event participated less in sport than those who had not experienced such an event. Specifically, the sport frequency of respondents not in full-time education and those working more than 32 hours a week in both waves was, respectively, 45% (Exp(B) = 0.550) and 8.7% (Exp(B) = 0.913) less than that of their counterparts. In addition, the sport frequency of respondents engaged in an intimate relationship and those who had formalised a relationship through cohabitation or marriage was, respectively, 13.9% (Exp(B) = 0.861) and 18.3% (Exp(B) = 0.817) less than that of singles and those without a formalised relationship. Last, parents participated 23.6% (Exp(B) = 0.764) less often in sport than non-parents.

All of the major life events also negatively affected within-person changes in sport frequency. In line with our expectations, we observed significant decreases in sport frequency when a major life event occurred between the two waves. Sport frequency decreased by 18.1% (Exp(B) = 0.819) when a person left full-time education, and it fell by 16.2% (Exp(B) = 0.838) when someone began working more than 32 hours a week. Additionally, for those who entered and formalised an intimate relationship, sport frequency decreased by, respectively, 15.2% (Exp(B) = 0.848) and 17.5% (Exp(B) = 0.825). Finally, sport frequency decreased by 23% when a person became a parent (Exp(B) = 0.770).

4.3. Switching from a club to a light setting or not practising sport at all

Table 3 presents descriptive statistics for the sport setting in wave 2, for those who practised sport in a club setting in wave 1 (N = 522). All in all, 52.7% of these respondents were still in a sports club in wave 2, 42% had switched to a light setting, and 5.4% had dropped out of sport. Considering the five major life events, continuation of sport in a club setting seemed least affected by starting a paid job (64.7% stability). It was most disturbed by entering an intimate relationship (44.9% stability). The switch to a semi-formal commercial or alternative setting was most common (15.7%).

Table 3. Descriptive statistics of the sport setting in wave 2, for individuals who practised sport (mostly) in a club setting in the first wave and experienced different major life events between wave 1 and wave 2.

Wave 2	Club setting (did not switch or stop)	Commercial/ alternative setting	Informal group setting	Individual setting (alone)	Not practising sport at all
Respondents who in wave 1					
Practised sport mostly in a club setting (100%; N = 522)	52.7%	15.7%	12.3%	14.0%	5.4%
And between wave 1 and 2					
Left full-time education (15.3%; N = 80)	51.3%	10.0%	15.0%	17.5%	6.3%
Started working (>32 hours a week) (9.8%; N = 51)	64.7%	11.8%	2.0%	13.7%	7.8%
Entered an intimate relationship (13.2%; N = 69)	44.9%	17.4%	10.1%	18.8%	8.7%
Started cohabiting/got married (14.2%; N = 4)	52.7%	9.5%	16.2%	14.9%	6.8%
Became a parent (7.3%; N = 38)	55.3%	7.9%	15.8%	13.2%	7.9%

Source: NELLS wave 1 (2009) and wave 2 (2013); N = 522.

Table 4. Effects of major life events on the odds of switching from practising sport in a club setting to practising sport in a light (commercial/alternative, group or individual) setting or not practising sport at all, versus continuing practising sport in a club setting.

Switching from practising sport (mostly) in a club setting to	Commercial/alternative setting[a]		Informal group setting[a]		Individual setting (alone)[a]		Not practising sport at all[a]	
	Exp(B)	sig.[b]	Exp(B)	sig.[b]	Exp(B)	sig.[b]	Exp(B)	sig.[b]
Major life events[c]								
Educational domain								
Continued full-time education	ref.		ref.		ref.		ref.	
Left full-time education	0.423	0.076+	1.109	0.822	1.724	0.253	0.869	0.843
Already left full-time education in wave 1	0.614	0.330	0.974	0.962	0.785	0.670	0.442	0.318
Employment domain								
Not working (>32 hours a week)	ref.		ref.		ref.		ref.	
Started working (>32 hours a week)	0.596	0.286	0.094	0.022*	0.893	0.809	1.454	0.550
Continued working (>32 hours a week)	0.709	0.345	0.544	0.129	1.080	0.834	0.876	0.816
Relationship domain								
Stayed single	ref.		ref.		ref.		ref.	
Entered an intimate relationship	1.404	0.431	0.909	0.847	2.899	0.024*	3.175	0.070+
Continued an intimate relationship	0.685	0.308	0.937	0.869	1.305	0.537	0.618	0.412
Civil/marital domain								
Not cohabiting/married	ref.		ref.		ref.		ref.	
Started cohabiting/got married	0.527	0.171	1.423	0.398	1.074	0.868	1.418	0.569
Continued cohabitation/marriage	0.694	0.360	1.257	0.626	0.906	0.816	0.898	0.859
Parental domain								
Stayed childless	ref.		ref.		ref.		ref.	
Became a parent	0.430	0.204	1.212	0.717	0.705	0.522	1.353	0.676
Already a parent in wave 1	0.882	0.767	1.017	0.972	0.501	0.090+	0.871	0.828

Source: NELLS wave 1 (2009) and wave 2 (2013); $N = 522$.

[a]Multinomial logistic regression analysis; Reference category = continuing sport participation (mostly) in a club setting.

[b]+$p < .10$; *$p < .05$ (two-tailed).

[c]We examined the influence of each event in a separate analysis, in which we controlled for gender, ethnicity, age, educational level, and number of sports.

However, the switch to a 'lighter' informal group setting seemed most likely among those who got married (16.2%) and those who had a child (15.8%). Moving to individual sporting was most common among those leaving full-time education (17.5%), beginning work (13.7%), and entering an intimate relationship (18.8%).

Investigating these effects more thoroughly, Table 4 presents the results of multinomial logistic regression analyses of switching from practising sport in a club setting to practising sport in several light settings, or not practising sport at all. The estimates presented in Table 4 deal specifically with the transition to adulthood within the five major domains and were controlled for gender, ethnicity, age, educational level, and number of sports. Our results show that the likelihood of switching from a club setting to a light setting, or stopping sport altogether, was influenced by life events within the educational, employment, and relationship domains. As expected, entering an intimate relationship increased the likelihood of dropping out of a club-organised sport. The odds of switching to an individual setting versus continuing in a club setting were 189.9% higher for respondents who found a partner between both waves (Exp(B) = 2.899), and these respondents were also 217.5% more likely to stop practising sport altogether (Exp(B) = 3.175), compared to those who stayed single. On the other hand, contrary to our expectations, the odds of switching to a commercial or alternative setting versus continuation in a sports club were 57.7% lower for those who left full-time education between both waves (Exp(B) = 0.423; reference is continuing full-time education). The odds of switching to a light setting were 90.6% lower for those who began working more than 32 hours a week between both waves (Exp(B) = 0.094; reference is not working). We expected that leaving full-time education and starting paid employment would be detrimental to sporting in a club setting.

5. Conclusion and discussion

This study examined the impact of five major life events that accompany the transition to adulthood on the number of sports practised, sport frequency, and the likelihood of switching from a club-organised sport to a 'lighter' sport setting, or dropping out of sport altogether. Our data was provided by a Dutch panel study with information on education, employment, relationship, civil/marital status, and parenthood for 2829 Dutch citizens, aged 15–45, and their sport behaviour. We used two survey waves, four years apart, to investigate the dynamics of sport participation. In particular, we focused on the influences of five major life events during the transition to adulthood, while making a 'between-within' differentiation in respondents' life courses. Doing so enabled us to deal with issues of causality and selectivity, and the timing of life events.

In line with our expectations, we found that leaving full-time education, beginning work, entering and formalising an intimate relationship, and becoming a parent affected the number, frequency, and/or setting of sport participation over the life course among our respondents. Sport frequency suffered from the occurrence of all these major life events. Respondents who experienced one of these events participated in sport less frequently than those who did not (between-person differences). Moreover, experiencing such an event reduced the sport frequency of individuals

(within-person changes). Additionally, four events (all except beginning work) had a negative impact on the number of sports practised. This was reflected in both between-person differences and within-person changes in the number of sports practised after leaving full-time education, entering an intimate relationship, and becoming a parent. For formalising a relationship through cohabitation or marriage we found only a between-person difference.

Additional analyses of interaction effects involving gender indicated that the impact of work on sport participation is negative for men, but positive for women. Working male respondents practised 13.9% fewer sports (Exp(B) = 0.861; p = .002) and participated 26.9% less frequently (Exp(B) = 0.731; p = .000) than non-working males, whereas working female respondents practised 9.9% more sports (Exp(B) = 1.099; p = .000) and participate 21.9% more frequently (Exp(B) = 1.219; p = .000) than their non-working counterparts. We also found gender differences for two other between effects (yielding statistically significant interactions), but only in the effect sizes and not in the 'direction': being in a relationship had a stronger negative effect on sport frequency of men, and being a parent had a stronger negative effect on the number of sports practised by women. None of the within effects of the life events differ between men and women. Our aim with this study was to get a better understanding of changes in sport participation during the transition to adulthood in general. According to these additional findings our conclusions are valid for the general population under investigation, as well as for men and women separately (except for the between effects of work). Nevertheless, they indicate that the impact of major life events on sport participation can be gendered and future research could benefit from a more gender comparative approach.

We, furthermore, found that when people entered an intimate relationship, they were more likely to switch from a 'heavy' club setting to a 'lighter' individual setting and to stop practising sport altogether, compared to those who stayed single. Based on our theoretical framework, we did not expect respondents who left full-time education and those who started working to be less likely to switch from a 'heavy' club setting to a 'lighter' setting, compared to those remaining in full-time education and not working. Although leaving full-time education and beginning work usually implies more time restrictions and social and professional obligations, which could hinder practising sport in a heavy setting, these findings are not very surprising viewed in light of earlier empirical work. Previous studies have shown that the highest dropout from club-organised sport is during late adolescence, when most people are still in full-time education (Borgers, Seghers, et al., 2016; European Commission, 2014; Lunn, 2010; Pilgaard, 2013; Scheerder et al., 2006). Similarly, previous findings have not associated starting a job with ending sports club membership (Van Houten et al., 2017). This might indicate that other life events experienced during adolescence (before leaving full-time education and beginning work, like entering secondary education) play a more import role in dropping out of club sport. Additionally, continued unemployment may lead to apathy (Vansteenkiste & Van den Broeck, 2014), not only towards finding a job, but also towards other social activities (Hobbins, 2016). From this perspective, it seems plausible that individuals who begin to work are more likely than those who do not work at all to keep practising sport in a club setting and not switch

to a lighter, less demanding setting, despite pressure exerted by their new social role and responsibilities. These would be worthwhile topics for future research.

While these findings shed new light on continuation of sport in the transition to adulthood, some limitations bear mentioning, as well as additional suggestions for future research. First, we used panel data with a four-year gap between waves. The occurrence of major life events during this gap might not yet have produced significant changes in sport participation, especially if an event occurred close to wave 2, if a gradual change or acceptance of the transition was at work or if the impact is different for men and women. This possible 'impact lag' could explain why, with respect to the effect of cohabitation/marriage on the number of sports, we did find between-person differences (reflecting long-term effects) but not within-person changes (short term). In future research, applying long-term longitudinal as well as qualitative methods for within-person effects, and comparing men and women, could provide valuable further information on when and how life events, separately or cumulatively, impact individual resources and lead to changes in sport participation. Second, the available data on sport frequency was not very detailed, with ordinal categories ranging from 'not at all' to '4 times or more per month', per sport activity. We recoded this to the approximate number of times someone participated in sport per month in total, settling for the fact that this could slightly differ from the actual sport frequency. In addition, as a consequence of the original ordinal data, changes in sport frequency between the two waves that stay within the range of one answer category, are unexposed. This may have led to an underestimation of changes in sport frequency and, more importantly, less power for the influence of the major life events. Third, we lacked data on time investment in sport. Although changing the number of sports, sport frequency, and sport setting may fulfil a need to spend less time on sport, due to increased time restrictions and social obligations, this is not necessarily the case. A person might still spend as much time on sport after making such changes, or they may spend less time on sport without making these changes. Fourth, our information on sport settings was limited to the sport most practised by the respondents. Since most people practise more than one sport simultaneously (Lefèvre & Ohl, 2012; also true for our respondents based on the average number of sports practised, see Table 1), this was probably their favourite sport, suggesting that they would try to continue it in the same setting – possibly at the expense of other sports – while accommodating life events. Considering these issues, major life events could have even more pronounced effects on the actual sport frequency, the time spent on sport and the setting of activities related to sports other than their most favourite sport. Therefore, in future research, measuring and analysing the setting and other detailed characteristics, like time expenditure and actual frequencies, of all people's sports activities would be preferable.

In sum, our study underscores the importance of major life events in understanding when, why, and in what setting people continue, change, or stop sport participation, especially during the transition to adulthood. Our results provide food for thought for policymakers and sport providers concerned with groups and moments at which people are particularly likely to reduce sport participation and leave club-organised sports. We recommend anticipating and responding to major life events with sport

programmes and facilities targeted to accommodate the new roles and responsibilities (resource-balance) of people experiencing these events. For example, facilitation of sport in and around schools and near the workplace and child-care offerings at clubs and other sport accommodations could encourage students, labour market entrants, and young parents to combine their study, work, and care activities with sport. Special partner, parent-child, educational, and business programmes could additionally stimulate people to start or continue sport, with or at the same time as their partner, children, classmates, or colleagues. People experiencing time pressure and for whom sport is not a priority could benefit from low-threshold activities in a light setting, for example, running, cycling, and outdoor workouts in public spaces. For these, safe and attractive infrastructure (cycling lanes, fitness equipment in and around parks and squares) is needed. Within a club setting, 'light' activities could be offered with more flexible membership options. These measures could pre-empt the impact of major life events, thus curbing drop out and retaining lifelong sport participants, especially during the transition to adulthood.

Disclosure statement

No potential conflict of interest was reported by the authors.

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